AMENDMENTS TO THE CLAIMS:

1. (Currently amended) A programmable amplifier comprising:

an input fiber emitting a light beam comprised of at least two optical signals;

a demultiplexer receiving said light beam and directing said at least two optical signals along separate paths;

a variable attenuator on said separate paths, said variable attenuator comprising a micromirror receiving said at least two optical signals and attenuating each optical signal;

a multiplexer receiving and combining said attenuated optical signals;

an optical amplifier receiving and amplifying said combined optical signal;

a splitter receiving said amplified combined optical signal and removing a component of said signal;

a spectrum analyzer receiving said component of said signal and determining the strength of each said at least two optical signals; and

a system controller receiving a measured power level from said spectrum analyzer and providing attenuation control signals to said attenuator.

2. (Original) The programmable amplifier of Claim 1, said demultiplexer comprising a diffraction grating.

3. (Original) The programmable amplifier of Claim 1, said multiplexer comprising a diffraction grating.

4. (Original) The programmable amplifier of Claim 1, said demultiplexer and said multiplexer comprising a single diffraction grating.

5. (Canceled)

6. (Original) The programmable amplifier of Claim 1, said variable attenuator comprising a digital micromirror array.

7. (Original) The programmable amplifier of Claim 1, said variable attenuator comprising a micromirror array having at least two mirrors for each said optical signal.

8. (Original) The programmable amplifier of Claim 1, said optical amplifier comprising an erbium doped fiber amplifier.

9. (Currently amended) A method of balancing an optical channel, the method comprising:

providing an input light beam comprised of at least two optical signals;

directing said at least two optical signals along separate paths;

attenuating said at least two optical signals directed along separate paths comprising reflecting a portion of said optical signals along said separate paths using a micromirror array;

combining said attenuated optical signals;

amplifying said combined optical signal;

removing a component of said amplified combined optical signal;

determining the strength of each said at least two amplified optical signals; and

controlling said amplifying based on said determined signal strength.

10. (Original) The method of Claim 9, said directing comprising directing said at least two optical signals using a diffraction grating.

11. (Original) The method of Claim 9, said directing comprising reflecting said at least two optical signals using a diffraction grating.

12. (Original) The method of Claim 9, said directing comprising passing said at least two optical signals through a diffraction grating.

13. (Original) The method of Claim 9, said combining comprising combining said at least two optical signals using a diffraction grating.

14. (Original) The method of Claim 9, said combining comprising reflecting said at least two optical signals using a diffraction grating.

15. (Original) The method of Claim 9, said combining comprising passing said at least two optical signals through a diffraction grating.

16. (Canceled)

17. (Original) The method of Claim 9, said attenuating comprising reflecting a portion of said optical signals along said separate paths using a digital micromirror array.

18. (Original) The method of Claim 9, said attenuating comprising reflecting a portion of said optical signals along said separate paths using a micromirror array having at least two mirrors for each said optical signal.

19. (Original) The method of Claim 9, said amplifying comprising passing said combined optical signals through an erbium doped fiber amplifier.